Amendments to the Claims

Please amend the claims as instructed in the marked-up version of the Listing of the Claims presented below. This Listing of the Claims replaces all prior versions, and listings of the claims in the application.

Listing of the Claims

1.   (Currently Amended) A sensor assembly comprising:

a transducer chosen from among a plurality of transducer types, each type configured to sense a different environmental characteristic;

a memory element coupled to the transducer and configured to store a plurality of transducer signatures, each transducer signature ~~identifying~~ comprising a transducer ~~type~~ identifier and calibration parameters; and

a processor coupled to the memory and configured to store an adaptive algorithm, to identify the ~~transducer~~ type of the transducer using the transducer ~~signatures~~ identifier, to configure at least one analog signal conditioning component using the calibration parameters, to process the environmental characteristic using the ~~transducer signatures~~ configured analog signal conditioning component and the adaptive algorithm, and to output the processed environmental ~~characteristics~~ characteristic.

2.   (Cancelled)

3.   (Currently Amended) The sensor assembly of claim 1, and wherein the ~~transducer signatures~~ calibration parameters comprise a transducer temperature compensation parameter.

4.   (Currently Amended) The sensor assembly of claim 1, further comprising a reporting device coupled to the processor and configured to receive and report the processed environmental characteristic ~~characteristics~~ from the processor.

5.   (Currently Amended) The sensor assembly of claim 4, and wherein the processor automatically identifies the reporting device, and automatically adjusts the processed environmental characteristic ~~characteristics~~ based on the identified reporting device.

6.   (Original) The sensor assembly of claim 4, and wherein the reporting device comprises at least one of a local display, a personal computer ("PC"), an industrial programmable logic controller ("PLC"), a telemetry system, and a data logging system.

7.   (Original) The sensor assembly of claim 1, further comprising a transducer preamplifier coupled to the transducer, and configured to amplify the sensed environmental characteristic.

8.   (Currently Amended) The sensor assembly of claim 1, and wherein the processor repeatedly and automatically detects to identify the <u>type of</u> transducer.

9.   (Currently Amended) The sensor assembly of claim 1, and wherein the processor chooses an adaptive algorithm based on the ~~transducer signatures~~ <u>identified type</u> of the ~~identified~~ transducer.

10.   (Original) The sensor assembly of claim 1, further comprising at least one signal converter coupled to the transducer and configured to convert the sensed environmental characteristic to a desired output format.

11.   (Original) The sensor assembly of claim 10, and wherein the at least one signal converter comprises a sigma-delta analog-to-digital converter, and wherein the desired output format comprises digital data.

12.   (Currently Amended) The sensor assembly of claim 1, and wherein the processor calibrates the environmental characteristic with the ~~transducer signatures~~ <u>calibration parameters</u> and the adaptive algorithm.

13.   (Cancelled)

14.   (Currently Amended) The sensor assembly of claim 1, further comprising a transducer housing configured to house the transducer and the memory <u>element</u>, and a body housing configured to house the processor and coupled to the transducer housing.

15.   (Currently Amended) The sensor assembly of claim 1, further comprising a housing configured to house the transducer, the memory element, and the processor.

16.   (Currently Amended) A sensor assembly comprising:

a sensing head having a transducer chosen from among a plurality of transducer types, each type configured to sense a different environmental characteristic, and a memory element coupled to the transducer and configured to store a plurality of transducer signatures, each transducer signature ~~identifying~~ comprising a transducer ~~type~~ identifier and calibration parameters; and

an adapting body coupled to the sensing head, to receive the transducer signatures and the environmental characteristic from the sensing head, the adapting body having a processor configured to store an adaptive algorithm, to identify the ~~transducer~~ type of the transducer using the transducer ~~signatures~~ identifier, to configure at least one analog signal conditioning component using the calibration parameters, and to process the environmental ~~characteristics~~ characteristic using the ~~transducer signatures~~ configured analog signal conditioning component and the adaptive algorithm, and to generate an output representative of the environmental characteristic.

17.   (Cancelled)

18.   (Currently Amended) The sensor assembly of claim 16, and wherein the calibration parameters ~~transducer signatures~~ comprise a transducer temperature compensation parameter.

19.   (Original) The sensor assembly of claim 16, further comprising a reporting device coupled to the processor and configured to receive and report the output from the processor.

20.   (Original) The sensor assembly of claim 19, and wherein the processor automatically identifies the reporting device, and automatically adjusts the output based on the identified reporting device.

21.   (Original) The sensor assembly of claim 19, and wherein the reporting device comprises at least one of a local display, a personal computer ("PC"), an industrial programmable logic controller ("PLC"), a telemetry system, and a data logging system.

22. (Original) The sensor assembly of claim 16, further comprising a transducer preamplifier coupled to the transducer, and configured to amplify the sensed environmental characteristic.

23. (Currently Amended) The sensor assembly of claim 16, and wherein the processor repeatedly and automatically detects to identify the type of transducer.

24. (Currently Amended) The sensor assembly of claim 16, and wherein the processor chooses an adaptive algorithm based on the identified type transducer-signatures of the identified transducer.

25. (Original) The sensor assembly of claim 16, further comprising at least one signal converter coupled to the transducer and configured to convert the sensed environmental characteristic to a desired output format.

26. (Original) The sensor assembly of claim 25, and wherein the at least one signal converter comprises a sigma-delta analog-to-digital converter, and wherein the desired output format comprises digital data.

27. (Currently Amended) The sensor assembly of claim 16, and wherein the processor calibrates the environmental characteristic with the transducer-signatures calibration parameters and the adaptive algorithm.

28. (Currently Amended) The sensor assembly of claim 16, and wherein the transducer adapting body comprises at least one of a local data display and a keypad, a personal computer ("PC") communication cable, a programmable logic controller ("PLC") communication cable, a telemetry device, a multi-sensor adapter device, and a data storage device.

29. (Currently Amended) A method of measuring an environmental characteristic with a transducer assembly, wherein a transducer head is coupled to a transducer body, the transducer head has a memory storing a plurality of transducer signatures, each transducer signature comprises a transducer identifier and calibration parameters, and the transducer body has a processor, the method comprising:

retrieving a ~~plurality of~~ transducer ~~signatures~~ identifier and calibration parameters from the memory;

processing the transducer identifier ~~signatures~~ to identify the type of the transducer at the processor;

configuring at least one analog signal conditioning component using the calibration parameters;

sensing a signal indicative of the environmental characteristic using the transducer;

conditioning the signal indicative of the environmental characteristic using the processor with ~~an adaptive firmware stored in the transducer body and the processed signatures~~ the configured analog signal conditioning component and an adaptive algorithm; and

outputting the conditioned signal indicative of the environmental characteristic.

30. (Cancelled)

31. (Currently Amended) The method of claim 29, and wherein the ~~transducer signatures~~ calibration parameters comprise a transducer temperature compensation parameter.

32. (Previously Presented) The method of claim 29, and wherein outputting the conditioned signal indicative of the environmental characteristic further comprises:

coupling the transducer body to a reporting device; and

reporting the conditioned signal indicative of the environmental characteristic on the reporting device.

33.   (Previously Presented) The method of claim 32, further comprising:

automatically identifying the reporting device; and

automatically adjusting the conditioned signal indicative of the environmental characteristic based on the identified reporting device.

34.   (Original) The method of claim 32, and wherein the reporting device comprises at least one of a local display, a personal computer ("PC"), an industrial programmable logic controller ("PLC"), a telemetry system, and a data logging system.

35.   (Previously Presented) The method of claim 29, further comprising amplifying the signal indicative of the environmental characteristic.

36.   (Currently Amended) The method of claim 29, wherein ~~processing the transducer signatures to identify the transducer at the processor~~ processing the transducer identifier to identify the type of the transducer at the processor further comprises repeatedly and automatically detecting to identify the type of the transducer.

37.   (Currently Amended) The method of claim 29, further comprising choosing an adaptive algorithm based on the ~~transducer signatures~~ type of the ~~identified~~ transducer.

38.   (Previously Presented) The method of claim 29, wherein outputting the conditioned signal indicative of the environmental characteristic further comprises formatting the signal indicative of the environmental characteristic.

39.   (Previously Presented) The method of claim 38, wherein the signal indicative of the environmental characteristic is in an analog format, the method further comprising converting the environmental characteristic from the analog format into a digital format using a sigma-delta conversion.

40.   (Previously Presented) The method of claim 29, wherein conditioning the signal indicative of the environmental characteristic using the processor further comprises calibrating the environmental characteristic.

41.   (Original) The method of claim 29, and wherein the transducer body comprises at least one of a local data display and a keypad, a personal computer ("PC") communication cable, a programmable logic controller ("PLC") communication cable, a telemetry device, a multi-sensor adapter device, and a data storage device.

42.   (New) A sensor adapter operably configured to receive a transducer, the transducer

configured to sense data indicative of an environmental characteristic and having a memory

configured to store a transducer identifier and calibration parameters, the sensor adapter

comprising:

a processor configured to receive, from the transducer, the data indicative of the

environmental characteristic, the transducer identifier, and the calibration parameters, to identify

the type of the transducer using the transducer identifier, to configure an analog signal

conditioning circuit based on the calibration parameters, and to adaptively process the received

data from the transducer using the configured analog signal conditioning circuit and an adaptive

algorithm; and

an output interface configured to receive the processed data from the processor and to

report the processed data.

43.   (New) The sensor adapter of claim 42, and wherein the processor is configured to

automatically identify a reporting device coupled to the output interface.

44.   (New) The sensor adapter of claim 42, and wherein the processor is configured to choose

the adaptive algorithm based on the identified type of the transducer.